

WHAT IS CLAIMED IS:

1 1. A method implemented in a computer program to provide a map of site-specific
2 amounts of a soil nutrient to be applied in fertilizer to an agricultural field divided into sites,
3 the method comprising:

4 calculating for the field, from a map of site-specific field characteristic data for the
5 field, a map for the field of site-specific amounts of the soil nutrient needed to produce at
6 each site a maximum possible crop yield; and

7 subtracting, from the site-specific soil nutrient amounts for maximum yield for the
8 field, site-specific measures of the soil nutrient existing in the field, thereby producing a map
9 of site-specific amounts of the soil nutrient to be applied in fertilizer to the field.

1 2. The method of claim 1, wherein the field characteristic is a measure of biomass
2 produced by the field in one or more past growing seasons.

1 3. The method of claim 2, further comprising:

2 calculating, from a map of site-specific image data taken of the field during one or
3 more past growing seasons, a map of site-specific measures of a leaf area index, the leaf area
4 index serving as the measure of biomass produced by the field.

1 4. The method of claim 2, further comprising:

2 calculating, from a map of site-specific image data taken of the field during one or
3 more past growing seasons, a map of site-specific measures of a vegetation index, the
4 vegetation index serving as the measure of biomass produced by the field.

1 5. The method of claim 1, further comprising:

2 calculating, from a topographic map for the field, a map of site-specific measures of a
3 soil wetness index, the wetness index serving as the field characteristic.

1 6. The method of claim 1, wherein the soil nutrient is nitrogen.

1 7. The method of claim 1, wherein the soil nutrient is phosphorous.

1 8. The method of claim 1, wherein the soil nutrient is potassium.

1 9. The method of claim 1, wherein the soil nutrient is organic fertilizer.

1 10. The method of claim 9, wherein the organic fertilizer is manure.

1 11. The method of claim 1, wherein the soil nutrient is a micronutrient.

1 12. The method of claim 11, wherein the micronutrient is Zn.

1 13. The method of claim 11, wherein the micronutrient is Fe.

1 14. The method of claim 1, further comprising:

2 calculating for the field, from a map of site-specific image data taken of the field in a
3 bare soil state, a map of site-specific measures of soil brightness; and

4 calculating the site-specific measures of the soil nutrient existing in the field from at
5 least the map of site-specific measures of soil brightness.

1 15. The method of claim 1, wherein the site-specific measures of the soil nutrient existing
2 in the field are calculated from at least a map of site-specific measure of soil electrical
3 conductivity.

1 16. A method implemented in a computer program to provide a map of site-specific
2 amounts of a soil nutrient to be applied in fertilizer to an agricultural field divided into sites,
3 the method comprising:

4 calculating for the field, from a map of site-specific measures of the biomass of one
5 or more past crops grown in the field, a map for the field of site-specific amounts of the soil
6 nutrient needed to produce at each site a maximum possible crop yield;

7 calculating for the field, from a map of site-specific image data taken of the field in a
8 bare soil state, a map of site-specific measures of soil brightness;

9 calculating site-specific measures of the soil nutrient existing in the field from at least
10 the map of site-specific measures of soil brightness;

11 subtracting, from the site-specific soil nutrient amounts for maximum yield for the
12 field, site-specific measures of the soil nutrient existing in the field, thereby producing a map
13 of site-specific amounts of the soil nutrient to be applied in fertilizer to the field.

1 17. The method of claim 16, wherein the soil nutrient is nitrogen.

1 18. The method of claim 16, wherein the soil nutrient is phosphorous.

1 19. The method of claim 16, wherein the soil nutrient is potassium.

1 20. The method of claim 16, wherein the soil nutrient is organic fertilizer.

1 21. The method of claim 16, wherein the soil nutrient is a micronutrient.

1 22. A computer program, residing on a computer-readable medium, for providing a map
2 of site-specific amounts of a soil nutrient to be applied in fertilizer to an agricultural field
3 divided into sites, the computer program comprising instructions for causing a computer to:

4 calculate for the field, from a map of site-specific field characteristic data for the
5 field, a map for the field of site-specific amounts of the soil nutrient needed to produce at
6 each site a maximum possible crop yield; and

7 subtract, from the site-specific soil nutrient amounts for maximum yield for the field,
8 site-specific measures of the soil nutrient existing in the field, thereby producing a map of
9 site-specific amounts of the soil nutrient to be applied in fertilizer to the field.

1 23. The computer program of claim 22, wherein the field characteristic is a measure of
2 biomass produced by the field in one or more past growing seasons.

1 24. The computer program of claim 23, wherein the instructions further cause the
2 computer to:

3 calculate, from a map of site-specific image data taken of the field during one or more
4 past growing seasons, a map of site-specific measures of a leaf area index, the leaf area index
5 serving as the measure of biomass produced by the field.

1 25. The computer program of claim 23, wherein the instructions further cause the
2 computer to:

3 calculate, from a map of site-specific image data taken of the field during one or more
4 past growing seasons, a map of site-specific measures of a vegetation index, the vegetation
5 index serving as the measure of biomass produced by the field.

1 26. The computer program of claim 22, wherein the instructions further cause the
2 computer to:

3 calculate, from a topographic map for the field, a map of site-specific measures of a
4 soil wetness index, the wetness index serving as the field characteristic.

1 27. The computer program of claim 22, wherein the soil nutrient is nitrogen.

1 28. The computer program of claim 22, wherein the soil nutrient is phosphorous.

1 29. The computer program of claim 22, wherein the soil nutrient is potassium.

1 30. The computer program of claim 22, wherein the soil nutrient is organic fertilizer.

1 31. The computer program of claim 22, wherein the soil nutrient is a micronutrient.

1 32. The computer program of claim 22, wherein the instructions further cause the
2 computer to:

3 calculate for the field, from a map of site-specific image data taken of the field in a
4 bare soil state, a map of site-specific measures of soil brightness; and

5 calculate the site-specific measures of the soil nutrient existing in the field from at
6 least the map of site-specific measures of soil brightness.

1 33. The computer program of claim 22, wherein the instructions cause the site-specific
2 measures of the soil nutrient existing in the field to be calculated from at least a map of site-
3 specific measure of soil electrical conductivity.